

**ABSTRACT**

Systems and methods for improving transducer response sensitivity in an ultrasound-imaging system are disclosed. A preferred method generally includes the steps of: selecting a desired transmit spectrum; quantifying the transmit channel  
5 impulse response; calculating a drive signal that when applied to the transmit channel will produce the desired transmit spectrum; and applying the drive signal to the transducer. Other methods include selecting a desired echo response spectrum; quantifying a receive channel impulse response; formulating a filter that when applied to received ultrasound echo signals will produce the desired echo response spectrum;  
10 and applying the filter. An improved ultrasound-imaging system may be realized with a transducer, a switch that is controlled to apply an excitation signal to the transducer in a transmit mode of the ultrasound-imaging system, and a signal shaper configured to generate an excitation signal in response to the impulse response of the transmit channel such that a desired ultrasound energy waveform is generated by the  
15 transducer. The improved system may also apply an adaptable filter responsive to a desired echo spectrum and the impulse response of the receive channel of the system.